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(54) **Surgical needle.**

(57) In a surgical needle (2), the surface of the puncture tip (6) and of the zone (8") of the needle (2) adjoining same up to ca. 50% of the needle length and/or the surface of the rear section (10") of the needle (2) which can account for up to ca. 50% of the needle length, up to the thread attachment (12), is matt-finished or coloured, continuously or with small breaks, by chemical or electrolytic means or by a covering. The surface of the remaining section (14) of the needle (2) consists of bare or untreated metal.

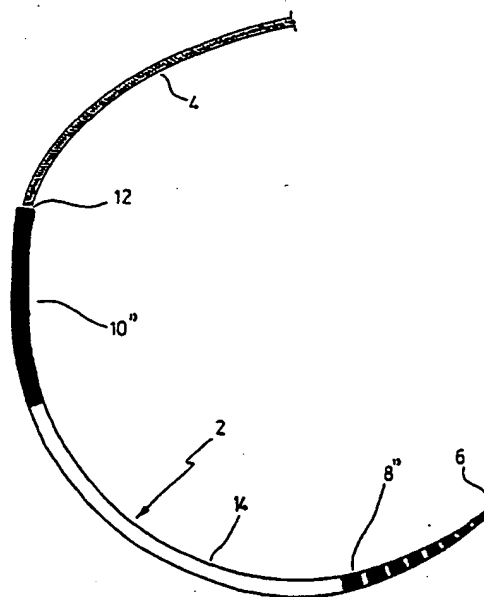


FIG. 3

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The invention relates to a surgical needle with a suture material or thread secured to the end opposite the puncture tip.

Such surgical needles are generally known and in most cases consist of a corrosion-resistant metal, preferably of chromenickel steel. With such needles, whose whole length is bare or has not been surface-treated, precise establishment of the puncture point and estimation of the puncture depth is frequently not unproblematical during an operation. In addition, when pulling out the needle after the tissue has been pierced, determination of how much further the needle must still be pulled until its rear section with the thread attachment has also emerged from the tissue is in many cases possible only with difficulty.

Known from U.S. Patent No. 3 840 015 is a surgical needle whose tip is provided with a photoluminescent covering which, when irradiated by a suitable source, is excited to light up. Otherwise the needle is bare or untreated at the surface. The photoluminescent covering improves the visibility of the needle tip, which is a help in establishing the puncture point and greatly facilitates the use of the needle. A disadvantage is

The object of the invention is to provide a surgical needle which can be handled more easily and which makes more precise operation possible.

This object is achieved by a surgical needle with the features of claim 1 and by a surgical needle with the features of claim 2. Advantageous versions result from the dependent claims.

With the inventive surgical needle according to claim 1, the surface of the puncture tip and of the zone of the needle adjoining same is matt-finished or coloured, continuously or with small breaks, by chemical or electrolytic means or by a covering, for up to ca. 50% of the needle length, while the surface of the remaining section of the needle up to the thread attachment consists of bare or untreated metal. As a result of the surface treatment, the zone of the puncture tip stands in clear contrast to the rest of the needle, which can be of great help to the surgeon in the precise establishment of the puncture point. Surprisingly, it turns out that a suture can also be created very precisely with such a needle according to the invention, which differs from the existing view that the needle zone which is to be emphasized must reflect light strongly or even light up itself. The surgical needle according to the invention also provides a marking carrier since, upon insertion of the needle, the surgeon can, by means of the still visible rear section of the surface-treated zone, establish quickly and surely the extent to which the needle has already advanced into the tissue. The operating procedure is greatly facilitated as a result.

With the inventive surgical needle according to claim 2, the surface of the puncture tip and of the zone of the needle adjoining same consists of bare or untreated metal, while the surface of the remaining section of the needle, which can account for up to ca. 50% of the needle length, is matt-finished or coloured, continuously or with small breaks, by chemical or electrolytic means or by a covering, up to the thread attachment. With this version, the special advantages which were explained above in connection with the zone of the puncture tip apply to the rear section of the needle. Because of the surface treatment of the rear section, this stands in clear contrast to the remainder of the suture during operation. This makes it easier for the surgeon to grasp the needle quickly and surely in the right place with a needle holder. This version of the surgical needle according to the invention also serves as a marking carrier; and the surgeon can, by noting the length of the front zone of the rear section of the needle which, when the tissue is pierced, has already emerged on the other side of the tissue, tell quickly and surely how much further he still has to pull the needle until it has completely pierced the tissue.

In an advantageous version of the surgical needle according to the invention, not only the surface of the puncture tip and of the zone of the needle adjoining same up to ca. 50% of the needle length, but also the surface of the rear section of the needle, which can account for up to ca. 50% of the needle length, up to the thread attachment, are subjected to a surface treatment, while in the middle section of the needle the surface consists of bare or untreated metal. With such a version, both the zone of the puncture tip and the rear section of the needle are clearly marked and contrasted, so that on the one hand the puncture point can be precisely established and on the other the needle is also more recognizable when being pulled out. A needle designed in such a way thus combines the advantages of the two versions explained above.

The section of the needle subjected to a surface treatment need not be continuously coloured or matt-finished, but can for example also be matt-finished or coloured in annular or speckled form, the surface between the rings or speckles being bare or untreated. The intermediate spaces lying bare in the zone which is matt-finished or coloured with breaks are preferably not to be larger than 1 to 2 mm. This gap is enough to create a closed impression of the zone of the puncture tip or of the rear section of the needle. On the other hand, the bare areas can improve the visibility or conspicuousness of the corresponding needle zone.

The invention will be explained in more detail below with the help of embodiments. The drawings show:

Figure 1 a magnified representation of a surgical needle according to the invention in which the surface of the puncture tip and of the zone adjoining same is continuously matt-finished or coloured,

Figure 2 a magnified representation of a surgical needle according to the invention in which the rear sec-

tion is matt-finished or coloured in speckled form, and
 Figure 3 a magnified representation of a surgical needle according to the invention which has the zone of the puncture tip matt-finished or coloured in annular form and in which the rear section is continuously matt-finished or coloured.

5 The needle 2 shown in Figures 1 to 3 is a normal semi-circular round-bodied needle; the needle can, however, have any desired form and be, for example, a blunt round-bodied needle, a cutting needle or a spatula needle. Located at one end of the needle 2 is the puncture tip 6, which can also be designed as a microtip, while a thread attachment 12, where a thread 4 made from surgical suture material is secured, is formed at the opposite end of the needle 2.

10 In the version according to Figure 1, the surface of the puncture tip 6 and of the zone 8 of the needle 2 adjoining same are continuously matt-finished or coloured by chemical or electrolytic means or by a covering. The surface-treated zone accounts for less than 50% of the needle length and preferably less than 25% of the needle length.

A suitable colouring or matt-finishing can be achieved either by chemical means through pickling or etching, or electrolytically through appropriate anodic or cathodic treatment, where appropriate with polarity inversion or through alternating current. A special form of pickling is so-called dipping or matt-dipping. Stoving lacquers can also be used for colouring or matt-finishing.

The surface of the remaining section 10 of the needle 2 is untreated, i.e. consists of bare or untreated metal, up to the thread attachment 12 in the version according to Figure 1.

20 In the version of the needle 2 shown in Figure 2, the surface of the puncture tip 6 and of the zone 8' adjoining same consists of bare or untreated metal. The surface of the remaining or rear section 10' is matt-finished or coloured in the form of speckles. The gaps between the speckles are not to exceed 1 to 2 mm. The remaining section 10' of the needle 2 accounts for less than 50% of the needle length, preferably for less than 25%.

25 Figure 3 shows a version in which the surface of the puncture tip 6 and that of the zone 8'' of the needle 2 adjoining same is matt-finished or coloured in annular form, whereby the matt-finished or coloured rings, which can be of any width, are ca. 1 to 2 mm apart. The rear section 10'' of the needle 2 is continuously matt-finished or coloured. In between lies the middle zone 14, whose surface consists of bare or untreated metal and which preferably extends over at least 50% of the needle length.

30 With all the needles shown, the colour in the matt-finished or coloured zones can agree with the colour of the thread 4, which offers the additional advantage that the coding colour of the thread is intuitively detectable when needles are in packs.

35 Claims

1. Surgical needle with a suture material or thread (4) secured to the end opposite the puncture tip (6), characterized in that the surface of the puncture tip (6) and of the zone (8) of the needle (2) adjoining same is matt-finished or coloured, continuously or with small breaks, by chemical or electrolytic means or by a covering, for up to ca. 50% of the needle length, while the surface of the remaining section (10) of the needle up to the thread attachment (12) consists of bare or untreated metal.
- 40 2. Surgical needle with a suture material or thread (4) secured to the end opposite the puncture tip (6), characterized in that the surface of the puncture tip (6) and of the zone (8') of the needle (2) adjoining same, extending over more than ca. 50% of the length of the needle, consists of bare or untreated metal, while the surface of the remaining section (10') of the needle (2) is matt-finished or coloured, continuously or with small breaks, by chemical or electrolytic means or by a covering, up to the thread attachment (12).
- 50 3. Surgical needle according to claim 1 and claim 2, characterized in that the surface of the puncture tip (6) and of the zone (8'') of the needle (2) adjoining same up to ca. 50% of the needle length as well as the surface of the rear section (10'') of the needle (2) which can account for up to ca. 50% of the needle length, up to the thread attachment (12), is matt-finished or coloured, continuously or with small breaks, by chemical or electrolytic means or by a covering, while in the middle section (14) of the needle (2) the surface consists of bare or untreated metal.
- 55 4. Surgical needle according to claim 1 or 2, characterized in that the zone (8; 10') of the needle (2) whose surface is matt-finished or coloured, continuously or with small breaks, by chemical or electrolytic means or by a covering, accounts for less than 25% of the needle length.

5. Surgical needle according to claim 3, characterized in that the middle section (14) of the needle (2) whose surface consists of bare or untreated metal accounts for at least 50% of the needle length.
6. Surgical needle according to one of the previous claims, characterized in that the matt-finished or coloured zone or zones of the needle are matt-finished or coloured in annular form (8") or in speckled form (10'), the surface between the rings or speckles being bare or untreated.

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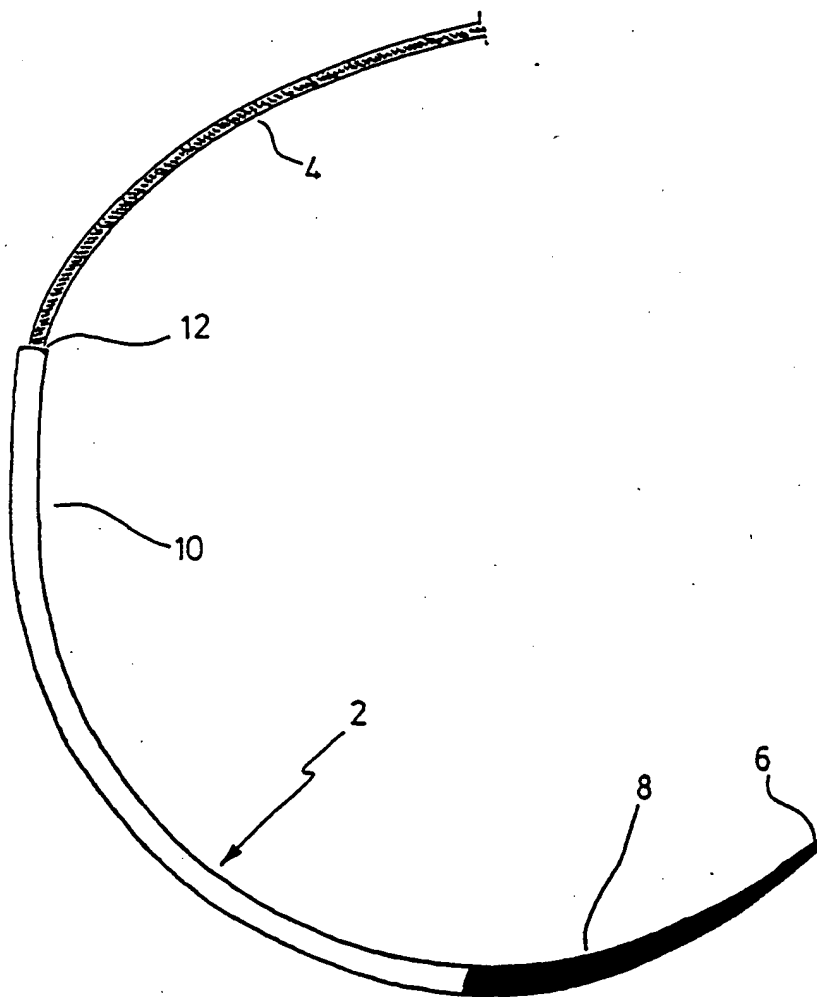


FIG. 1

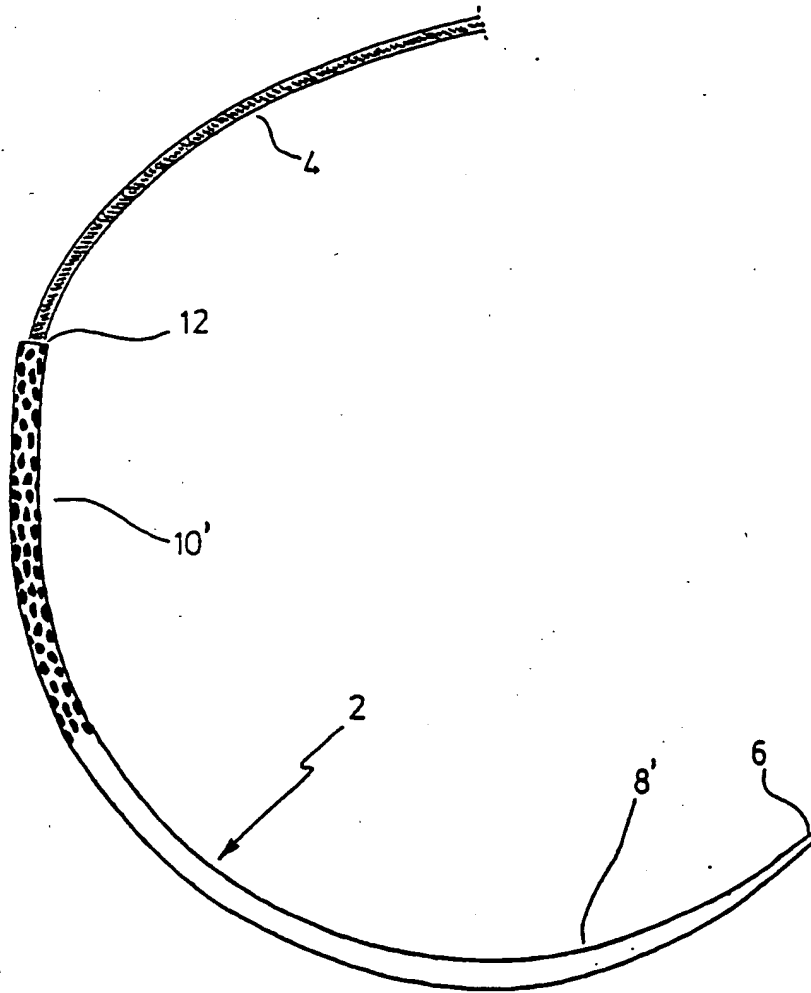


FIG. 2

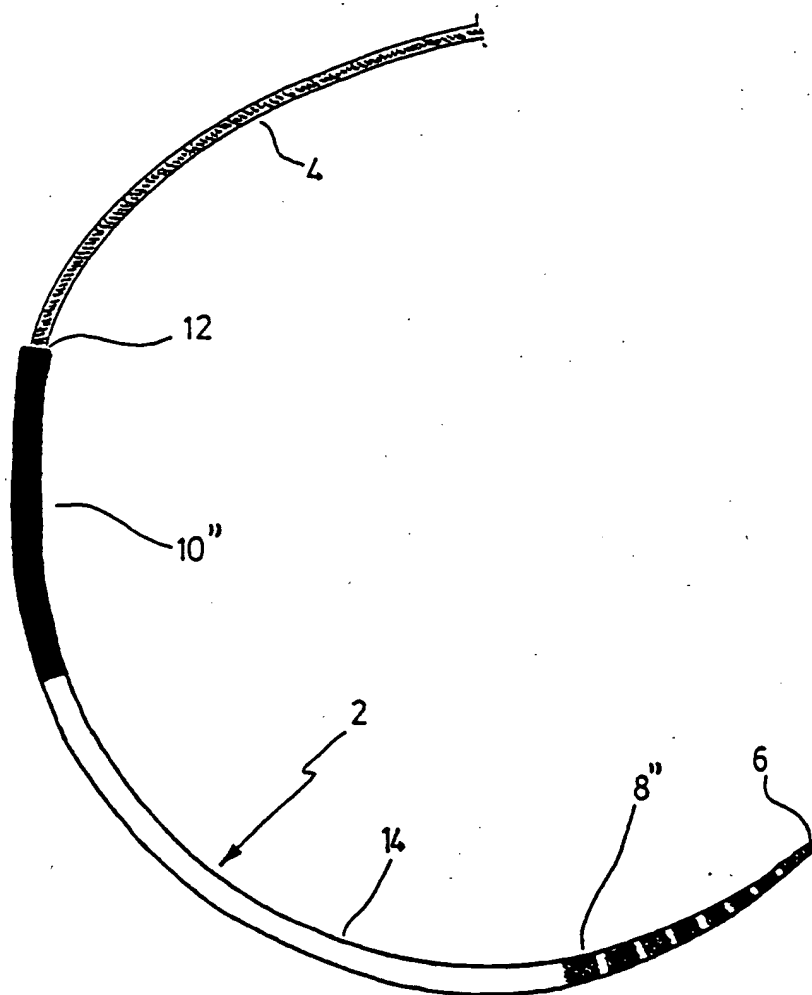


FIG. 3



European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 94 25 0021

| DOCUMENTS CONSIDERED TO BE RELEVANT | | | |
|--|---|--|--|
| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (Int.Cl.5) |
| A,D | US-A-3 840 015 (GAIN) * column 2, line 53 - line 59; figure 3 * | 1,2 | A61B17/06 |
| A | DE-C-38 41 443 (SINGER) * claims 1,5; figure 2 * | 1,2 | |
| A | PATENT ABSTRACTS OF JAPAN vol. 13, no. 286 (C-613) (3634) 29 June 1989 & JP-A-10 083 252 (KAIHATSU) 29 March 1989 * abstract * | 1,2 | |
| A | EP-A-0 296 776 (MATSUTANI SEISAKUSHO) * column 9, line 25 - line 38; figures 3,5 * | 2 | |
| X,P | DE-C-42 08 242 (ETHICON) * claims 1,2; figures 1-3 * | 2,4,6 | |
| | | | TECHNICAL FIELDS SEARCHED (Int.Cl.5) |
| | | | A61B |
| The present search report has been drawn up for all claims | | | |
| Place of search THE HAGUE | | Date of completion of the search 18 May 1994 | Examiner Moers, R |
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